Cedar Butte Sagebrush Restoration and Habitat Improvement Project

Background

The Cedar Butte sagebrush restoration and habitat improvement project is located at the western edge of the Eastern Snake River Plain approximately five miles southwest of Atomic City, Idaho. The 5,210 acre project is comprised entirely of BLM-administered public lands and is nestled between the Big Southern Butte to the west and the Cedar Butte Lava Flow to the east (Map 1). The project area is located in whole or in part within Township 1 N., Range 30 E., Sections 10-11, 13-15, 21-28, 34-35 and Township 1 S., Range 30 E., Section 1. The topography of the project area consists of gently rolling lava plains with associated basalt bluffs that transition into the steep slopes of the remnant Cedar Butte shield volcano. Elevations range from 5,000 feet on the southern end of the project area to over 5,800 feet above sea level on the upper rim of the Cedar Butte crater. The annual precipitation in the area averages approximately 9.5 inches, while temperatures range between 86ºF for a high and 3ºF for a low. The project area consists of 16 adjacent treatment units that range in size from 40 to 800 acres.

The BLM-administered public lands within the Cedar Butte project area were historically a mosaic of shrub and herbaceous dominated vegetation with scattered patches or clumps of Utah juniper (*Juniperus osteosperma*) that were mainly confined to the south facing slopes and upper elevations of the butte (Map 2). The historical native vegetation was comprised of two plant communities; inter-mountain basins big sagebrush steppe and inter-mountain basins juniper savanna. Big sagebrush steppe sites historically consisted of perennial grasses and forbes (>25% cover) with Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), basin big sagebrush (*Artemesia tridentata tridentata*) and/or antelope bitterbrush (*Purshia tridentata*) dominating or codominating the open to moderately dense (10-40% cover) shrub layer. In contrast, the juniper woodland sites historically consisted of greatly reduced quantities of perennial grasses, forbs and shrubs (<20% cover) with a codominant or dominant overstory (10-30% cover) of Utah juniper. The disturbance regime for these vegetation communities mainly focused around fire, however, drought, climate shifts and insects and disease outbreaks did play a lesser role and depending upon the severity could have led to the replacement of the stand. Fires within the sagebrush steppe mainly consisted of stand-replacement fires while fires within the juniper woodland consisted of mixed severity fires. In both cases estimated fire return intervals (FRI) were between 35–100+ years, with juniper savannas experiencing the upper end of that range (≈ 185 years).

Fire records dating back to the early 1940's (74 years) show little evidence of wildfire activity within those BLM lands that make up the Cedar Butte project area. While several charred juniper stumps were encountered during site evaluations, it was theorized that those fires were likely single tree or small (<10 acres) in size and not recorded within the fire atlas. However, since 1960, four fires have burned adjacent to the east boundary of the Cedar Butte project area while at least 15 other fires have burned within three miles of the project area. As a result, much

of the area that was once categorized a Key Greater sage-grouse habitat has now been downgraded to Restoration 1 (R1) perennial grassland habitat, essentially leaving Cedar Butte an island of intact sagebrush steppe. As with wildfire, none of the project area has experienced any past vegetation treatments. The only treatments that have occurred within the vicinity of the project area in the recent past were an aerial sagebrush seeding and native/non-native drill seeding that were in response to the 1999 and 2000 calendar year fires that burned portions of the Big Desert planning area.

Though FRCC data for both vegetation cover types was calculated to be a one (FRCC I: Area is within the historical range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances), it is surmised that juniper encroachment into the adjacent sagebrush steppe is in fact largely due to a lack of disturbance. If left unchecked, this continued expansion threatens to reduce the quality and quantity of the existing Greater sage-grouse and other sagebrush obligate species habitat. Greater sage-grouse are now listed as a candidate species by the US Fish and Wildlife Service (FWS) whereby the FWS have determined that listing is warranted but has been precluded. Juniper encroachment is a threat to Greater sage-grouse and treatments are necessary to maintain populations living on the fringe of juniper habitats throughout the species range. Treatments, such as the mechanical removal of encroaching junipers, can reduce competition and increase space and nutrient availability to promote the native sagebrush steppe vegetation. This would promote a more diverse sagebrush steppe cover type, as opposed to a landscape dominated by mature Utah junipers and barren understories.

Quantitative and qualitative monitoring conducted during the summer of 2014 by the BLM USFO Fuels Crew to determine tree densities and species composition within the 16 treatment units revealed that portions of the project area have concentrations of young junipers which have migrated out of the historic juniper stands and encroached into the adjacent sagebrush steppe. Within those sagebrush steppe areas vegetative cover was calculated to be 13% native herbaceous (grasses and forbs) cover, 15% sagebrush cover and only 1% juniper cover (approximately 6 trees per acre). In contrast, those areas classified as juniper woodlands displayed very little native herbaceous and shrub vegetation. The area consists primarily of open to closed stands of Utah juniper, which have inhibited the establishment and expansion of the native herbaceous and shrub component. Within the juniper woodland treatment areas, mature Utah juniper accounted for 75% of the live tree density with an average of 189 trees per acre, while seedlings and saplings account for the remaining 25% with an average of 64 trees per acre. Based upon an average basal area of 38 ft^2, the average percent cover of Utah juniper was factored to be approximately 29%. Within the stands, native perennial understory herbaceous cover was calculated at 8% while average cover for sagebrush was only 3%. While a majority of the plots displayed little or no annual grass (cheatgrass) cover, those that did resulted in an average cover of less than 1%. While overall vegetative conditions within both the sagebrush steppe and juniper woodland units appear to be near site potential when compared to the

Biophysical Settings (BpS) Model for these specific cover types, it does provide an opportunity to effectively remove those encroaching junipers (within the sagebrush steppe) while they are still young and in relatively low density without the need to reseed or rehabilitate the site post treatment. Tables 1 and 2 summarize the monitoring data in relation to percent vegetative cover and tress per acre within the project area.

Table 1: Vegetative Cover within the Cedar Butte Project Area.

Plot	Perennial Grass Cover (%)	Annual Grass Cover (%)	Annual Forb Cover (%)	Perennial Forb Cover (%)	Sagebrush Cover (%)	Other Shrub Cover (%)	Standing Dead (%)	Juniper Cover (%)
1	5.125	0.125	0	4	5.375	0	0.75	30
2	4.375	0	0	0.75	0	0	0	31
3	2.75	0.5	0	0	0	0	5.75	31
4	4.875	0.125	0	0	0	0	0	25
5	8.375	0.375	0.125	0.25	23.25	0	16.875	0
6	4.125	0.75	0	0.5	7.75	0	0.75	24
7	6.5	0.375	0	0.375	0	0	0	32
8	9.5	0	0.125	1.125	10.125	0.375	0	33
9	2.75	0.125	0	0.125	0	0	0.75	34
10	9.875	0	0	12.125	7.625	0.25	0.125	25
11	6.25	0.125	0.125	5.125	22.875	1.75	1.625	0
12	8.375	0	0.875	10.875	10.125	0	4	0
Avg. Cover	**6.1**	**0.2**	**0.1**	**2.9**	**7.3**	**0.2**	**2.6**	**22.1**

Table 2: Juniper Density within the Cedar Butte Project Area.

Plot	Trees (per acre)	Saplings (per acre)	Seedlings (per acre)	Total Trees (per acre)
1	180	60	100	340
2	300	50	0	350
3	310	50	0	360
4	220	70	0	290
5	0	0	0	0
6	240	30	0	270
7	290	80	100	370
8	210	70	0	380
9	310	80	0	390
10	210	80	0	290
11	0	0	0	0
12	0	0	0	0
Avg. Cover	**189.2**	**47.5**	**16.67**	**253.3**

Proposal

Under the Proposed Action, a total of 1,656 acres categorized as historic Utah juniper woodlands and 3,554 acres categorized as sagebrush shrubland would be mechanically or manually treated over a ten year period. Depending on funding levels, one to two units, varying in size from 40 to 800 acres, would be treated annually during the life of the project (Map 3). Treatments would include chainsaws and other hand tools, mechanical equipment (e.g. Off-Highway Vehicles [OHV], chippers, soft tired and tracked vehicles), and prescribed fire (pile burning). Treatments would selectively thin or remove encroaching Utah juniper from within the 16 treatment units except where protected for unique characteristics (such as late-seral, nest/cavity trees, snags, cultural concerns or erosion concerns). Within the historic juniper woodlands, treatments would selectively thin young junipers that have encroached into the sagebrush islands located within the interior of the stands. Treatments would focus on maintaining the irregularly shaped sagebrush openings and creating more edge habitat between the two plant communities. Within the sagebrush steppe, where juniper encroachment is categorized as Phase I (Grasses and shrubs are dominant over junipers); treatments would focus on removing all encroaching junipers. In most cases this would be accomplished by manual means through lop and scatter prescriptions. However, in areas containing higher densities of junipers mechanical treatments may be employed. The overall objective of the project is to decrease the juniper competition and increase the availability of water and nutrients so as to maintain and, where possible, improve the distribution and composition of native sagebrush steppe vegetation. Access for treatment implementation would be attained through existing roads and by foot. No new access roads, either temporary or permanent, would be constructed.

Treatments would consist of removing encroaching junipers through the use of a masticator attached to a tracked excavator or soft tired loader. Use of an excavator would minimize impacts to soils and existing vegetation due to its ability to treat large areas (2,000 ft^2) from a central location through the use of its articulating boom/arm that moves independently of the tracked undercarriage. The soft tired version, such as a front-end loader with a horizontally mounted mastication head, would be more applicable in situations where junipers are widely separated and a more agile piece of equipment would be needed to quickly move throughout the unit(s). To further mitigate impacts to soils and existing vegetation, mastication treatments would only be implemented during the months of November – January when the ground is snow covered and/or frozen and vegetation is dormant. Areas having slopes greater than 30 % may require the use of chainsaws or other hand tools to implement treatments due to safety concerns and use limitations associated with the machinery. Chainsaw treatments would include lop and scatter or piling and burning. Should piling be utilized, slash piles would be sufficiently spaced between leave trees to prevent pile to tree torching during burning. The development of a burn plan would occur prior to the implementation of any pile burning treatments, with the actual ignition of the piles occurring the following fall/winter succeeding a significant precipitation event.

Should the use of prescribed fire be warranted to dispose of piled treatment slash, a mixture of native herbaceous seeds (Table 3) would be broadcast and raked into the burn scars to promote recovery of the site. Additionally, top soil adjacent to the burn area may also be incorporated into the burn scar to revitalize the potentially heat sterilized soil.

Table 3: Seeded Species and Rates of Application —The following seed mix is formulated specifically for the Cedar Butte project area based on the current vegetation and is comprised of a mix of native grasses and forbs.

Species (1)		Common Name	Percent	Lb. acre (2) (3)	Comments
Grasses	*Pseudoroegneria spicata*	Bluebunch Wheatgrass	18	4	Long-lived, perennial bunchgrass with good palatability for wildlife. Best adapted to 10-20 inch precipitation zones. Drought resistant, aids in soil stabilization and is an important component of sage-grouse habitat.
	Elymus wawawaiensis	Snake River Wheatgrass	18	4	Long-lived, perennial bunchgrass. Best adapted to 10-20 inch precipitation zones. Very drought tolerant bunchgrass that is desirable for erosion control. Highly palatable and has a high protein content.
	Achnatherum hymenoides	Indian Ricegrass	14	3	Drought tolerant bunchgrass that is desirable for erosion control. Best adapted to 8-14 inch precipitation zones. Important component of sage-grouse habitat, is highly palatable and has a very high protein and fat content
	Elymus elymoides	Bottlebrush Squirreltail	14	3	Drought tolerant short-lived bunchgrass that is an important component of sage-grouse habitat. Best adapted to 5-10 inch precipitation zones. An early seral species that outcompetes annual weedy species.
	Achnatherum thurberianum	Thurber's Needlegrass	9	2	Important component of sage-grouse habitat and is considered desirable forage for wildlife in the spring. Best adapted to 7-16 inch precipitation zones.
	Poa ampla	'Sherman' Big Bluegrass	9	2	Long-lived, perennial bunchgrass with good palatability for wildlife and competes well with winter annual weeds. Best adapted to 10-24 inch precipitation zones.
Forbs	*Linum lewisii*	Lewis Flax	9	2	Provides some forage value and good erosion control. Best adapted to 10-18 inch precipitation zones.
	Penstemon palmeri	Palmers Penstemon	5	1	Used for restoration and wildlife enhancement plantings. Selectively used as forage by small birds, big game and livestock. Best adapted to10-16 inch precipitation zones.
	Astragalus filipes	Basalt Milvetch	2	0.5	A component of sage-grouse habitat. Best adapted to8-30 inch precipitation zones.
	Sphaeralcea coccinea	Scarlet Globemallow	2	0.5	Long-lived forb that is used for restoration and provides excellent forage for big game. Best adapted to 6-10 inch precipitation zones.
Total: 22 lb/ac.					

Notes

(1) Forbs that are unavailable or cost prohibitive may be deleted from the list. The forbs were added for species diversity and wildlife value.

(2) Application rates are derived from BLM and NRCS Plant Guides for the purpose of mixed species establishment. Actual application rates will vary depending upon seed availability and funding.

(3) Based on a broadcast or hydro-seeding rate of 22 lb. pure live seeds/acre. Rate should be halved for drill-seeding.

Chemical treatments may be required following mechanical treatment to reduce the occurrence of invasive species/noxious weeds or to treat re-sprouting juniper stumps. This would involve the application of herbicides at certain plant growth stages to suppress or kill the plant. Only those herbicides approved for use on public lands would be employed in chemical treatments subject to the standard operating procedures presented in the *Upper Snake-Pocatello Integrated Weeds Control Programmatic Environmental Assessment* and record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement*. Only ground-based application methods would be employed. Herbicides proposed for use under the Proposed Action are presented in Table 4.

Table 4: Herbicides Proposed for Use under the Proposed Action.

Herbicide	Herbicide Characteristics
2,4-D	Selective; foliar absorbed; post-emergent; annual/perennial broadleaf weeds.
Chlorsulfuron	Selective; inhibits enzyme activity, broadleaf weeds and grasses.
Clopyralid	Selective, mimics plant hormones; annual and perennial broadleaf weeds.
Dicamba	Growth regulator; annual and perennial broadleaf weeds and grasses.
Glyphosate	Non-selective, annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees.
Metsulfuron methyl	Selective; post-emergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees.
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs.
Tebuthiuron	Relatively non-selective soil activated herbicide; pre and post-emergent control of annual and perennial grasses, broadleaf weeds and shrubs.
Triclopyr	Growth regulator; broadleaf weeds and woody plants.
Imazapic	Selective post-emergent herbicide; inhibits broadleaf weeds and some grasses.

Details of the various actions to be implemented are summarized in Table 5 by treatment unit(s) number.

Table 5: Summary of Treatment Objectives, Methods and Acres by Treatment Unit(s).			
Treatment Unit(s)	**Acres**	**Treatment Method**	**Treatment Objectives**
Units D, E, F, K, N, O & P	3,554	• Lop and Scatter • Mastication	• Remove all age classes of juniper within the sagebrush steppe to improve/maintain shrub steppe community. • Maintain/improve wildlife habitat by enhancing species diversity and improving shrub community health. • Chemically treat non-native annual grasses to reduce spread potential following mechanical treatments.
Units A, B, C, G, H, I, J, L & M	1,656	• Selective thinning through the use of a masticator. • Selective thinning through hand crews. • Lop and scatter • Cut and pile • Pile burning to remove thinned slash.	• Reduce juniper canopy to improve shrub steppe communities. • Reduce the threat of uncharacteristic wildland fire and move community towards or maintain FRCC 1. • Improve wildlife habitat by increasing herbaceous and shrub species diversity. • Reduce the threat of erosion by increasing native understory vegetation. • Chemically treat non-native annual grasses to reduce spread potential following mechanical treatments.

Design Features

- Mechanical mastication work would occur during the late fall or early winter to reduce the chance of incidental fire ignition, to reduce fugitive dust emissions, to avoid peak native vegetative growing times, and to avoid impacts to migratory birds and sage-grouse. Chemical treatments would occur throughout the summer when optimal vegetation growth stage applications are most effective.

- Prior to surface-disturbing activities, all mechanical equipment and vehicles would be cleaned of all vegetation (stems, leaves, seeds, and all other vegetative parts) in order to minimize the transport and spread of invasive plants seeds.

- The use of certified weed-free seed mixes would be required to prevent the introduction of invasive plants.

- As funding allows, the treatment areas would be monitored for the presence of noxious weed species prior to and following implementation. Any weeds that are identified would be treated in accordance with the *Upper Snake-Pocatello Integrated Weeds Control Programmatic Environmental Assessment*.

- Trees displaying late-seral characteristics would not be cut. These characteristics include; crown shapes with flattened, rounded or uneven tops; branch structure having large branches near the base; dead branches with bark missing and/or covered by a light

green lichen; bark thick, fibrous with well-developed vertical furrows; and leader growth in the upper quarter of the tree usually <1 inch (Figure 1).

- Raptor nest surveys would be conducted prior to treatment. If a nest is determined to be occupied, it would be avoided by up to 1 mile depending on the species.

- Hand cutting would only occur between July 15 and January 30 so as to minimize impacts to sage-grouse and migratory birds.

- Treatments would be restricted in mule deer winter range during the late winter (February 1 – May 1).

- Treatments would be restricted in Greater Sage-grouse habitat during nesting and early brood-rearing seasons (May 1 – July 15).

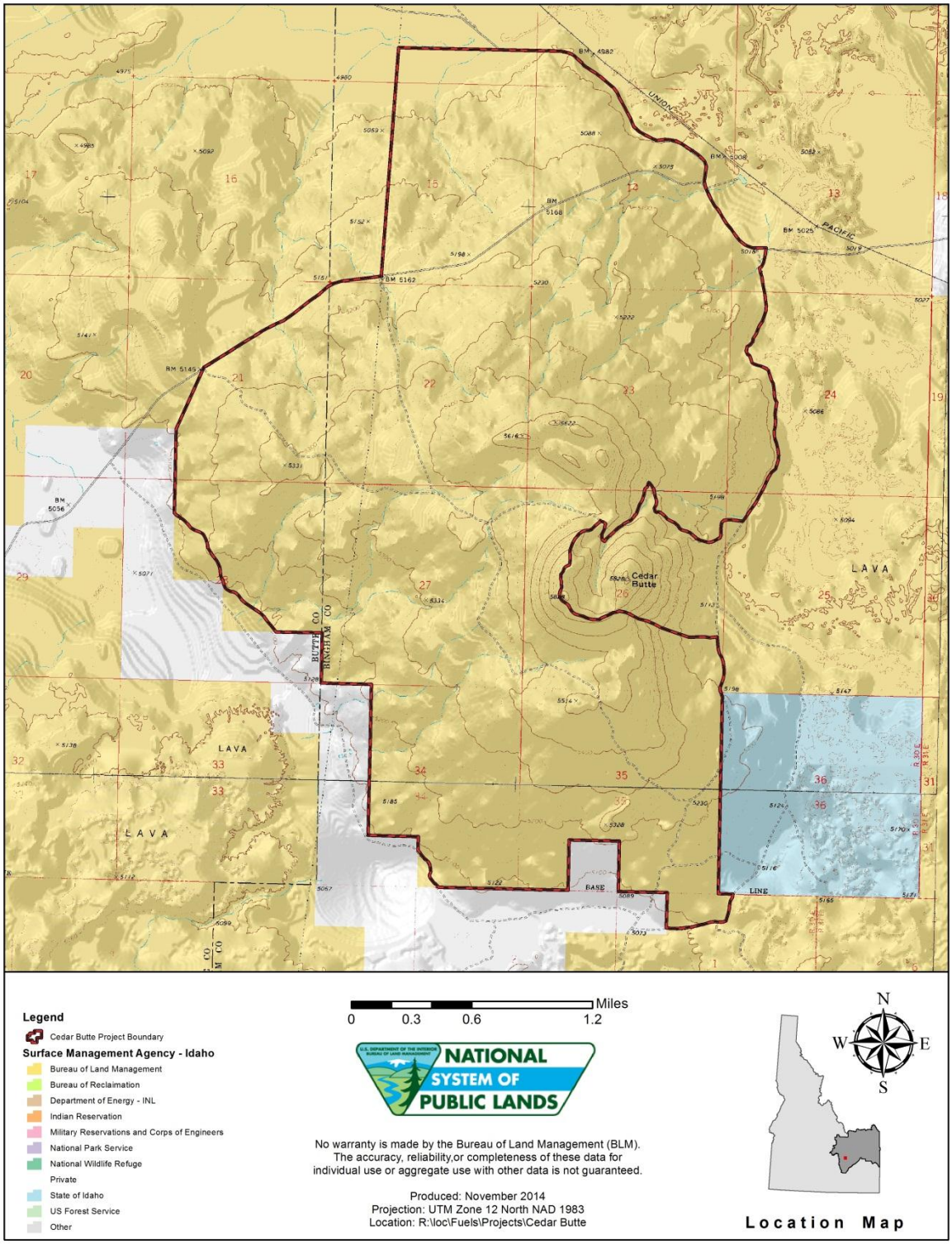
- All eligible or potentially eligible archaeological sites would be flagged prior to any ground-disturbing activities to avoid adverse effects. Sites that are located in areas proposed for treatment would be avoided.

- Should any sensitive plants be identified within the project area, sites would be flagged prior to any ground-disturbing activities to avoid adverse effects. Sites that are located in areas proposed for treatment would be avoided.

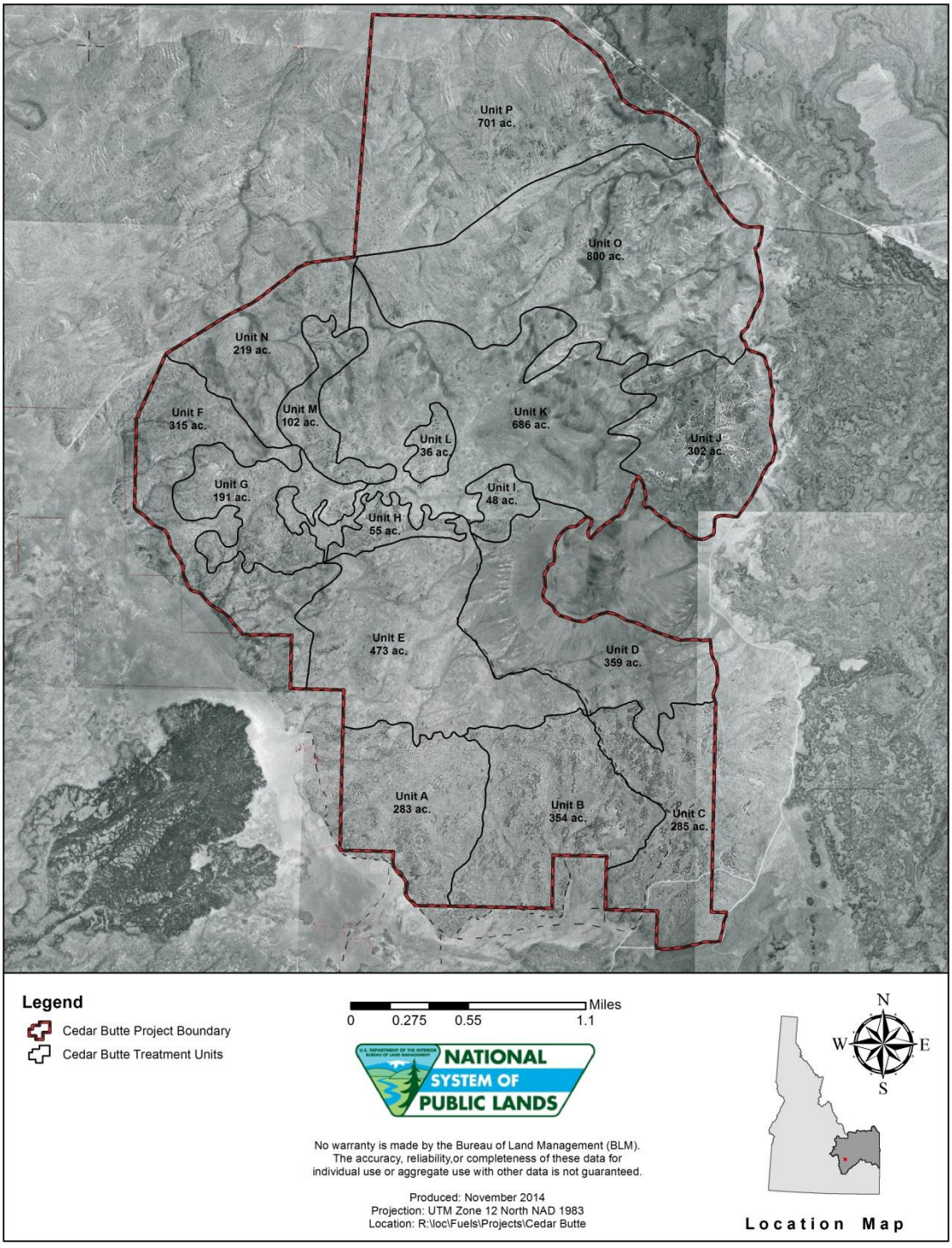
- Existing juniper snags would remain on site at a density of no more than two snags per acres, when available, for wildlife benefit.

Figure 1. Example of a juniper displaying late-seral characteristics that would not be cut based upon the guidelines identified in the previously discussed Design Features.

Map 1: Cedar Butte Sagebrush Restoration and Habitat Improvement Project Area.



Map 2: 1966 aerial photo of the Cedar Butte Project Area depicting the sparceness of the historic stands and overall lack of junipers in much of the low lying areas where they are currently present.



Map 3: Cedar Butte Sagebrush Restoration and Habitat Improvement treatment units Alternative A (Proposed Action).